REMARKS

Claims 1-5, 7, 8, and 10-44 are pending. Claims 5, 7, 25, 35-37, and 39 have been amended, claims 6 and 9 have been canceled, and new claims 41-44 have been added to recite additional features of the embodiments disclosed in the specification.

In the Office Action, claims 1, 4-8, 10-17, 19-30, 32-35, and 37-40 were rejected under 35 USC § 102(b) for being anticipated by the Mccormack patent publication. Applicants request the Examiner to withdraw this rejection for the following reasons.

Claim 1 recites that the inductor stores energy recovered from the panel "when the first switch is on." (See, for example, Figures 7 and 8 of the application drawings for support). These features are not disclosed by the Mccormack publication.

The Mccormack publication discloses an energy recovery circuit that transfers voltage between a buffer capacitor CB and a load capacitor CL through an inductor L1. The load capacitor CL corresponds to the panel, or panel capacitor. This is evident from the Mccormack disclosure which indicates that the panel represents the load. The buffer capacitor performs the function of storing energy recovered from the panel capacitor, after the energy is temporarily stored in inductor L1. See Paragraphs [37] and [38].

In the Office Action, the Examiner compared the first switch of claim 1 to switch S4. However, Mccormack does not disclose that inductor L1 stores energy recovered from the panel capacitor CL when switch S4 is on. This is because switch S4 is not located between inductor L1 or panel capacitor CL, nor does it control transfer of energy along a signal path between these

two elements. Rather, switch S4 controls the transfer of energy between the inductor and buffer capacitor.

Claim 1 also recites that the inductor stores energy recovered from the panel "at a time when a sustain voltage supplied to the panel is clamped at a predetermined voltage." (See, for example, period T2 in Figure 8 of the application drawings, where the panel capacitor voltage Vcp is maintained at at least a substantially constant value as a result of Cp being coupled to -VS when switch Q2 is turned on). The Mccormack publication does not disclose these features.

In Mccormack, the inductor stores energy from the panel capacitor CL. However, the panel capacitor is not clamped to a predetermined voltage at this time. In fact, Mccormack does not have any circuit which clamps the voltage of capacitor CL when energy is stored in inductor L1. (Vcc does not perform this function, i.e., voltage source Vcc serves to charge capacitor CL when switch S2 is closed. Vcc does not perform a clamping operation for capacitor CL when switch S4 is closed).

Thus, while inductor L1 stores energy from panel capacitor CL when switch S4 is closed, the sustain voltage to panel capacitor CL is not clamped at a predetermined voltage at this time. Rather, when S4 closes, the inductor current rises as a result of panel capacitor CL discharging. This discharging process causes a time-varying reduction in the panel capacitor voltage. The panel capacitor is not clamped at a predetermined voltage at this time period as required by claim 1. Rather, the panel capacitor voltage varies (decreases) during this time, so that it can supply energy to be stored in inductor L1.

Moreover, in the Office Action, the Examiner mentioned a clamping operation disclosed in Paragraph [37]. However, this clamping operation is performed between node Nj of inductor L1 and buffer capacitor CB, not between a first predetermined voltage and panel capacitor CL at a time when the inductor stores energy from the panel capacitor.

Furthermore, in the Office Action, switch S1 was mentioned in rejecting claim 1. However, S1 closes not to charge energy in the inductor "recovered from the panel," but to charge energy in the inductor from buffer capacitor CB during charging of panel capacitor CL This is evident from the direction of diode D1 in Figure 1.

Because the Mccormack publication does not disclose all the features of claim 1, it is respectfully submitted that the Mccormack publication does not anticipate claim 1. Furtherance of claim 1 and its dependent claims to allowance is respectfully requested.

Dependent claim 32 recites that "the inductor stores the energy during a time when the sustain voltage supplied to the panel is clamped at a negative voltage." These features are not disclosed by the Mccormack publication. Applicants therefore submit that claim 32 is allowable, not only by virtue of its dependency from claim 1 but also based on the features separately recited therein.

Claim 5 has been amended to recite that the "the inductor stores energy recovered from the plasma display and a sustain voltage applied to the plasma display is clamped at a predetermined voltage when the second switch is closed." These features are not disclosed by the Mccormack publication. (See, for example, the discussion above with respect to the

differences between Mccormack and claim 1.) Furtherance of claim 5 and its dependent claims to allowance is respectfully requested.

Claim 7 recites that the second current path passes energy from the panel capacitance for storage in the inductor when the second switch is on, that that "the inductor stores energy recovered from the panel capacitance and a sustain voltage applied to the panel capacitance is clamped at a predetermined voltage when the second switch is on." These features are not disclosed by the Mccormack publication. Furtherance of claim 7 and its dependent claims to allowance is respectfully requested.

Dependent claim 12 recite that "an energy of the inductor current is increased **prior to** the discharging of the display capacitance or the energy is decreased **prior to** charging of the display capacitance." (See, for example, Figure 13 of the application drawings, where during time period TB the inductor current is increased before the panel capacitor begins discharging and during time TC the inductor current is decreased before the panel capacitor begins charging. To see this more clearly, see the I_L curves during time period TB and TC). The ability to increase or decrease the inductor current before discharging or charging the panel capacitor may increase efficiency and power management of the panel. **These features are not disclosed by the Mccormack publication**. Applicants therefore submit that claim 12 is allowable, not only by virtue of its dependency from claim 7 but also based on the features separately recited therein.

Dependent claim 13 recites that, during charging or discharging, the display capacitance is clamped before a stored energy of inductor reaches zero. (See, for example, Figure 13 for support). These features are not disclosed by the Mccormack publication

Claim 19 recites that the inductor stores energy from the panel capacitor "while the panel capacitance is clamped at first predetermined voltage" and that the energy is removed from the inductor to cause the panel capacitance to change to a second predetermined voltage. These features are not disclosed by the Mccormack publication.

In Mccormack, the clamping operation is performed between node Nj of inductor L1 and buffer capacitor CB, not between a first predetermined voltage and panel capacitor CL. Moreover, the Mccormack inductor L1 does not store energy from the panel capacitor when switch S1 is closed, nor does the inductor store energy from the panel capacitor while panel capacitor CL is clamped at a first predetermined voltage when switch S4 is closed.

Based on these differences, it is submitted that claim 19 is allowable. Furtherance of claim 19 and its dependent claims to allowance is respectfully requested.

Claim 25 recites that "the inductive coil is coupled to the first power source voltage level and the second power source voltage level along signal paths that do not pass through any of the first or second switches or the pair of switches." (See, for example, Figure 7 of the application drawings, where voltage sources +Vs and -Vs are coupled to inductor L through node N2). These features are not disclosed by the Mccormack publication.

In the Office Action, the Examiner indicated that the first and second power source voltage levels correspond to Vcc and Vb, the switches of the clamping circuit correspond to S2 and S5, and the switches of the charging/discharging circuit correspond to S1 and S4. However, as shown in Figure 1, the voltage sources Vb and Vcc of Mccormack are coupled to inductor L1 through signal paths that pass through all four switches S1, S2, S4, and S5.

Based on these differences, it is respectfully submitted that claim 25 and its dependent claims are allowable over the Mccormack publication.

Claim 34 recites that "the inductor is the **only** circuit element for storing energy recovered from the panel capacitor." (See, for example, Figure 7 for support, where inductor L is the only circuit element used to store energy recovered from the panel capacitor Cp). These features are not disclosed by the Mccormack publication. As shown in Figure 1 and explained throughout its disclosure, the Mccormack circuit only temporarily stores energy recovered from its load (panel) capacitor CL in inductor L1. Once the stored energy reaches a peak value in the inductor, the inductor energy is output and stored in the buffer capacitor CB. This is evident from the IL1 and VL1 curves in the graph of Figure 2 of Mccormack.

The very purpose of buffer capacitor CB is to store recovered energy from the panel capacitor. Thus, Mccormack does not disclose the invention defined in amended claim 34. Based on these differences, it is submitted that claim 34 and its dependent claims are allowable.

Dependent claim 35 recites that the inductor is to store energy recovered from the panel capacitor "at a time when a sustain voltage supplied to the panel is clamped at a negative voltage." In other words, claim 35 requires the inductor to store energy from the panel capacitor at the same time the panel capacitor is clamped to the negative voltage. This is shown, for example, by Figure 8 of the application drawings where the inductor is shown to store energy while the panel capacitor voltage Vcp is maintained (clamped) at a constant level, -Vs, during time period T2.

These features are not disclosed by the Mccormack publication, i.e., Mccormack does not disclose that inductor L1 stores energy from panel capacitor CL at the same time the panel capacitor is clamped to a negative voltage. On the contrary, Mccormack discloses that the voltage stored in capacitor CL decreases as the energy in the inductor decreases. The Mccormack publication, therefore, does not disclose all the features of claim 35. Based on these differences, it is submitted that claim 35 and its dependent claims are allowable.

Claim 37 has been amended to recite that "the inductor is the only circuit that stores energy recovered from the panel." These features are not disclosed by the Mccormack publication, i.e., Mccormack uses both an inductor and a buffer capacitor to store energy from the panel capacitor CL. Based on these differences, it is respectfully submitted that claim 37 and its dependent claims are allowable.

Claim 39 has been amended to recite that "the inductor is coupled to the first voltage source and the second voltage source along signal paths that do not pass through any of the first or second switches or the pair of switches." (See, for example, Figure 7 for support). These features are not disclosed by the Mccormack publication, i.e., the inductor in Mccormack is coupled to voltage sources Vcc and Vb through the switches. Mccormack is therefore different from claim 39. Based on these differences, it is submitted that claim 39 and its dependent claims are allowable.

Claims 2, 3, 18, and 31 were rejected under 35 USC § 103(a) in view of a Mccormack-Lee combination. The Lee publication was cited for disclosing voltage sources having the same

absolute value. However, Lee does not teach or suggest the features of base claims 1 and 7 missing from the Mccormack publication.

Claim 36 has been amended to recite "a clamping circuit to clamp a panel capacitor to the at least one voltage source within a time period when the inductor stores energy output from the panel capacitor, wherein a voltage of the panel capacitor is maintained at a substantially constant level while the inductor stores the energy output from the panel capacitor." (See, for example, Figures 7 and 8 for support).

These features are not taught or suggested by the Lee and Mccormack publications, i.e., the load capacitor of Mccormack is not maintained at a substantially constant level when the inductor stores energy output from the panel capacitor. On the contrary, the voltage of capacitor CL decreases as energy is output to the inductor. Based on these differences, it is respectfully submitted that claim 36 is allowable.

Claim 31 was rejected under 35 USC § 103(a) for being obvious in view of a Mccormack-Nagai combination. The Nagai patent discloses transistor switches. But, Nagai does not teach or suggest the features of base claim 25 missing from the Mccormack publication. Based on these differences, it is respectfully submitted that claim 31 is allowable.

New claims 41-44 have been added to the application.

Claim 41 recites that "the energy stored in the inductor is maintained at a substantially constant level during said (clamping) time." (See, for example, Figures 8 and 13 of the application drawings for support). These features are not taught or suggested by the cited references, e.g., Mccormack discloses that the energy in the inductor rises as voltage is output

from panel capacitor CL. (This is evident from curve IL1 in Figure 2). Since curve IL1 at no time assumes a constant value, it is evident that the features of claim 41 are not taught or suggested by the Mccormack publication.

Claim 42 recite that "a panel capacitor coupled to the inductor is maintained at a substantially constant voltage during said time." These features are not taught or suggested by the cited references, i.e., Mccormack does not perform a clamping operation that causes panel capacitor CL to be maintained at a substantially constant voltage during a time when energy is stored in the inductor. This is evident from Paragraphs [37] and [38] and Figures 1 and 2 of Mccormack.

Claim 43 recites that "energy of the inductor current is increased independent from a panel capacitor." See, for example, Figures 12 and 13 for support, where, for example, the inductor current increases during period TB as a result of switches Q1 and Q4 being turned on. When switch Q1 turns on, it clamps the panel capacitor to voltage source +VS. During period TB, switch Q4 is turned on while Q1 is still on. As a result, the inductor current increases solely as a result of voltage source +VS, i.e., none of the voltage from the panel capacitor is used to increase the inductor current because the panel capacitor is clamped at this time. (See, for example, Paragraph [92] for a more detailed explanation of these features).

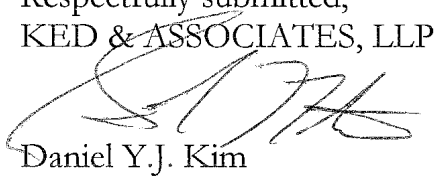
The Mccormack publication does not disclose the features of claim 43, and neither do any of the other references of record. Furtherance of claim 43 to allowance is respectfully requested.

Claim 44 recites that "the energy of the inductor is decreased independent from a panel capacitor." See, for example, Figure 13 which shows that switch Q3 is turned on at the same time as switch Q2 during time period TD. This causes the energy in the inductor to decrease independent from the panel capacitor. (See Paragraph [95] for a more in-depth explanation). The Mccormack publication does not disclose the features of claim 44, and neither do any of the other references of record. Furtherance of claim 44 to allowance is respectfully requested.

In view of the foregoing amendments and remarks, it is respectfully submitted that the application is in condition for allowance. Favorable consideration and timely allowance of the application is respectfully requested.

To the extent necessary, a petition for an extension of time under 37 CFR § 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this, concurrent and future replies, including extension of time fees, to Deposit Account 16-0607 and please credit any excess fees to such deposit account.

Respectfully submitted,
KED & ASSOCIATES, LLP



Daniel Y.J. Kim
Registration No. 36,186

Samuel W. Ntiros
Registration No. 39,318

P.O. Box 221200
Chantilly, Virginia 20153-1200
(703) 766-3777 DYK/SWN/krf
Date: May 4, 2009
Please direct all correspondence to Customer Number 34610
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